

After-sales Service Manual for WGG Solar Driven Vaccine Refrigerator

Model: HTC-60



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2. Functions and Major Features

2.1. Major Functions and Features

- ◆ Power provided fully by solar energy, environment-friendly.
- ◆ Controlled by microcomputer with the accuracy of LED digital temperature display at 0.1.
- ◆ Forced air circulation in the fresh compartment to ensure uniform temperature in the refrigerator.
- ◆ Door lock design to ensure more safe vaccine storage.
- ◆ The temperature in refrigerator as 2 – 10 °C in case of ambient temperature as 32 °C and 119 hours of power failure to ensure more safe vaccine storage.
- ◆ High and low temperature alarm controller. The alarm temperature point can be set according to the requirements. The compressor with nameplate, fluoride-free and environmental-friendly refrigerant as well as two ways of alarming (buzzer alarm and light signaling alarm) shall be adopted for the refrigerator.
- ◆ Anti-corrosion step-type inner liner design to match with various goods baskets.
- ◆ Continuous temperature display in the refrigerator in case of power failure of thermostat for check convenience.
- ◆ Low noise.

2.2 Model Denotation

H T C - □
A B C D

A: the first letter of Pinyin of Haier (Haier).

T: the first letter of the Pinyin of Taiyangneng (tai).

C: the first letter of the Pinyin of (Leng) Cang (cang).

D: capacity (unit: liter)

Example:

HTC-60

- denoting solar driven vaccine storage refrigerator with a capacity of 60 liters

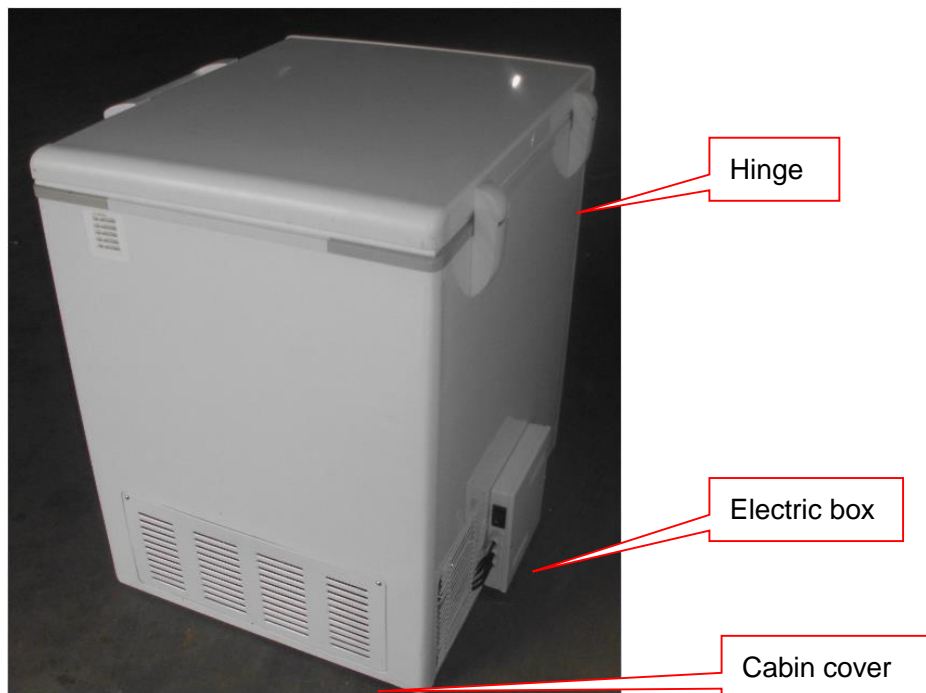
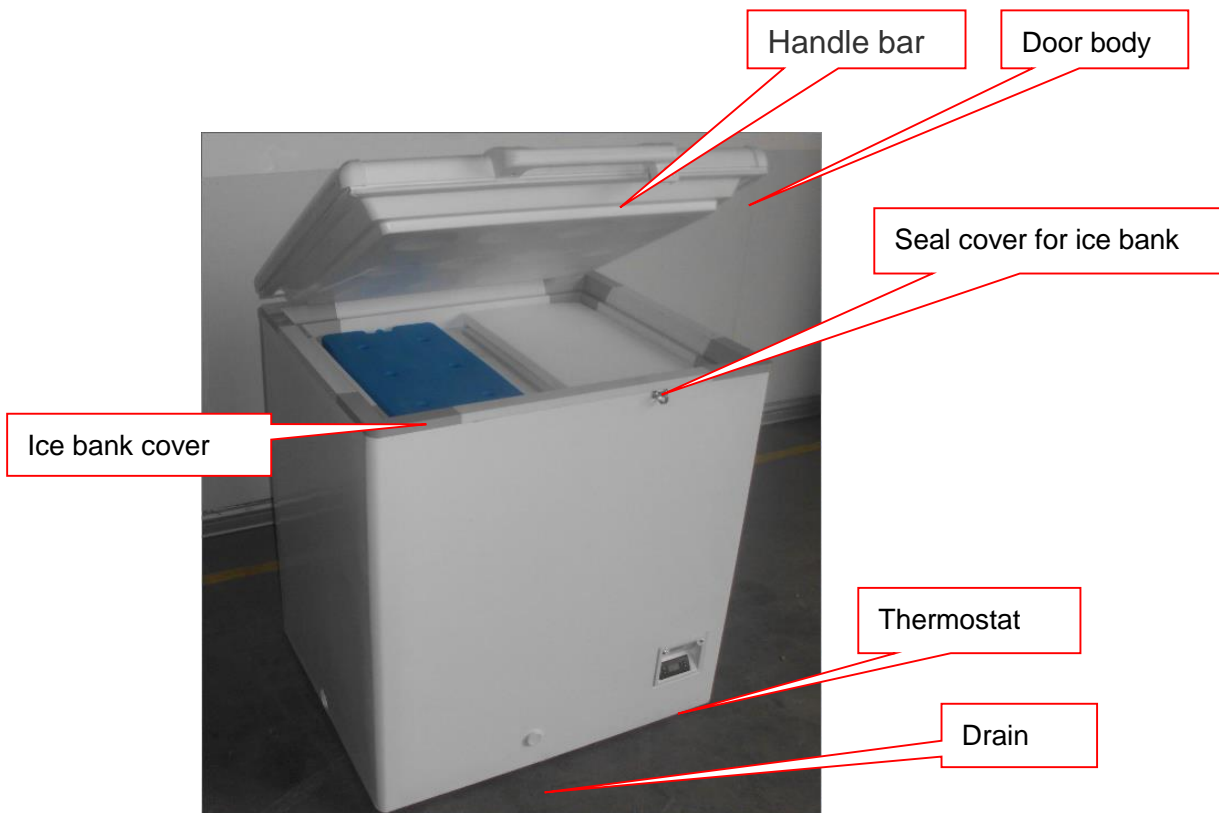
3. Promotion and Selling Points

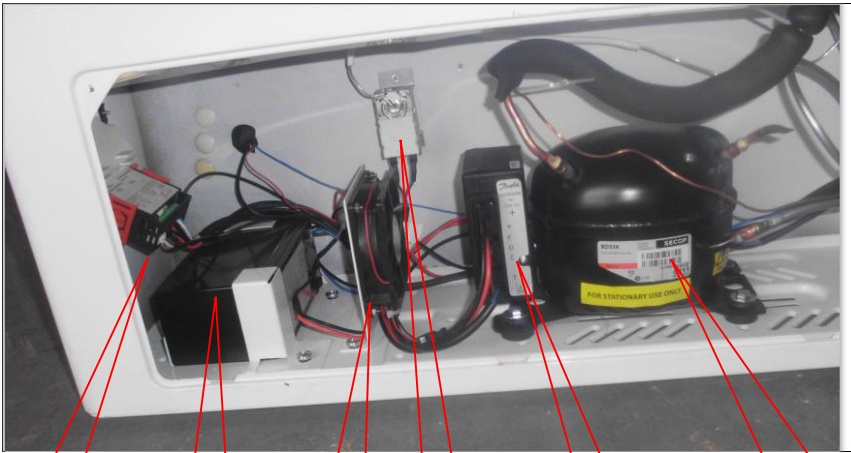
Major promotion and selling points:

1. No battery used during normal running, pollution-free and environmental-friendly.
2. Purely natural solar energy without the usage of electricity or fuel, energy-saving.
3. Ice bank to store refrigerating capacity and extremely long temperature holding time to ensure safe vaccine storage.

- 4. Low noise during operation.
- 5. Door lock design to ensure safe vaccine storage.
- 6. Digital temperature display in refrigerator.

4. Appearance and Structural Features





Therm
ostat

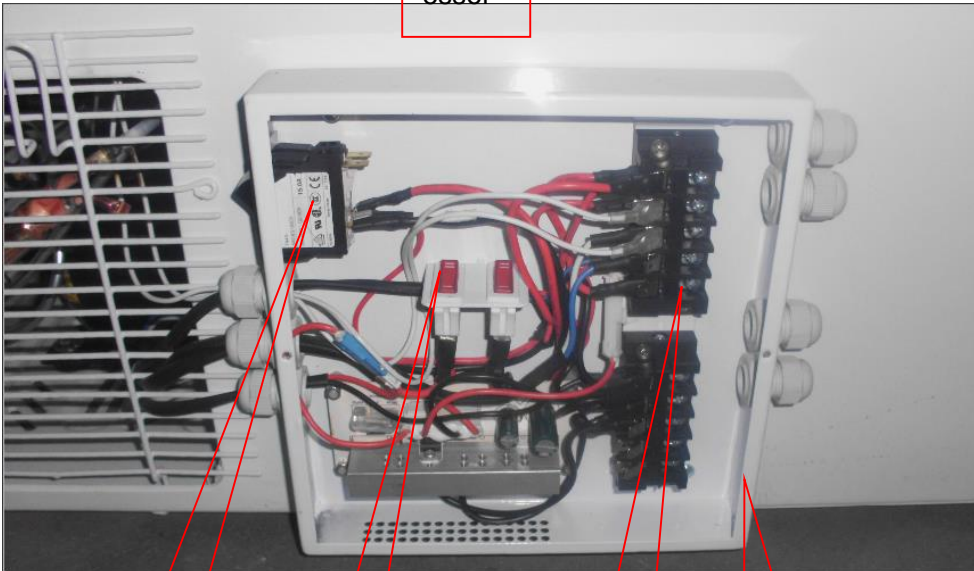
Battery

Blower

Therm
ostat
of
compr
essor

EBOX
of
compre
ssor

Compressor

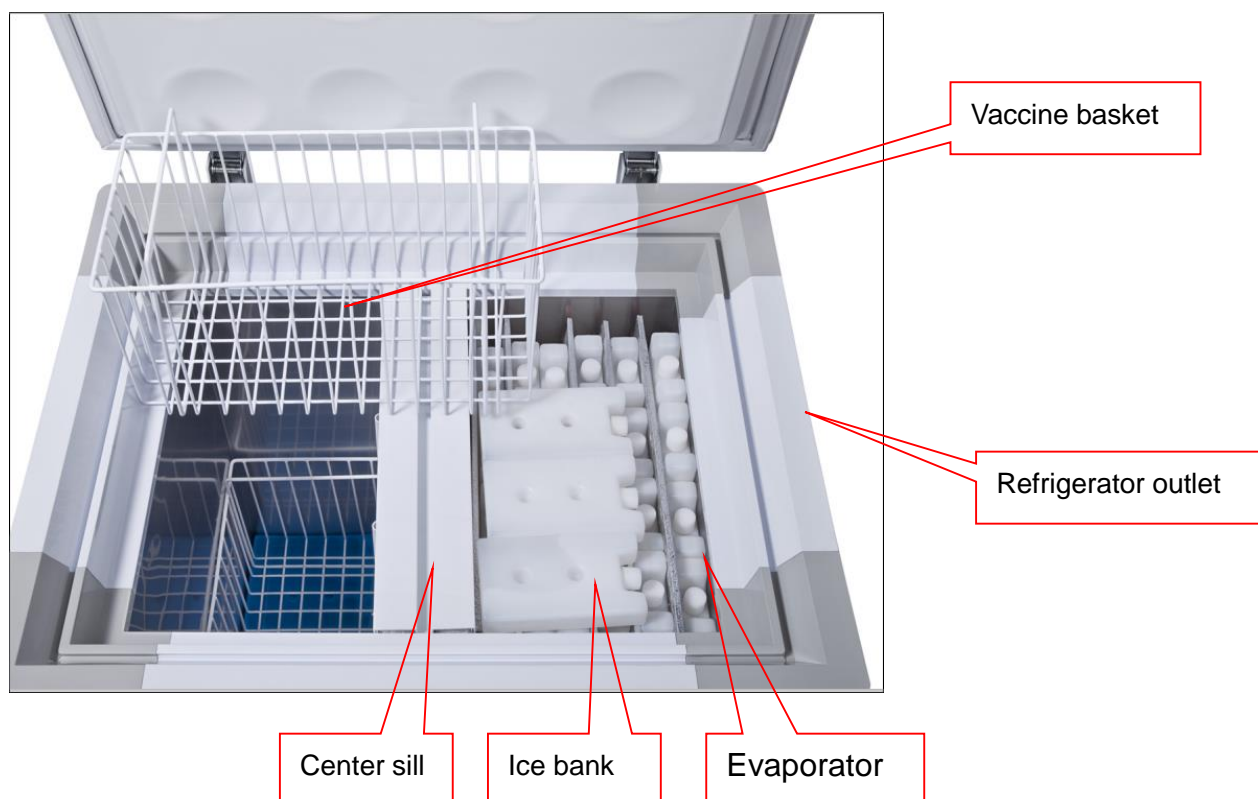


Battery
main switch

Switch

Connector
bar

Electric box



5. Name of Component Structure

Null.

6. Major Technical Parameters

6.1 List of Technical Parameters

1.	Description of Vaccine Refrigerator	Unit	Solar Driven Vaccine Refrigerator
	Model		HTC-60
	Door body type		Metal plate appearance
	Handle		External, plastic
	Optional color		/
2.	Major Features		
	Safety certificate		PQS
	Input power	W	90
	Max. current	A	5.2
	Power consumption	Kw.h/24 h	0.49
	Gross capacity	L	60
	Vaccine storage capacity	L	21
	Ambient temperature for usage		10-32
	Voltage of solar panel	V	12
	Refrigerant		R600a
	Quantity of compressor	n°	1
	Evaporator		Exposed into the inner liner
	Condenser		Concealed
	Base period of solar radiation	kwh/m ² /day	3.5
	Maintenance period	h	135
	Soaking time	h	119
	Power of solar panel	W	360

	Capacity of auxiliary rechargeable battery		12V9AH
3	Electrical Control		
	Electric control(electronic/mechanical)		Electronic/mechanical
	Electronic control display		Yes
	Over-temperature alarm		Yes
4	Vaccine Compartment		
	Food basket	n°	2
	Water outlet		Yes
5	Door Body and Refrigerator Body		
	Door shell		Powder coating for cold plate
	Refrigerator shell		Powder coating for cold plate
	Door liner		Specular PS
	Inner liner		Stainless steel inner liner
	Foam vesicant		Cyclopentane
6	Overall Dimensions and Installability		
	Dimension of machine body (including handle) (width/depth/height)	mm	788*745*875
	Package Dimension (width/depth/height)	mm	850*770*1115 (with wood base)
	Net weight	kg	78
	Gross weight	kg	88
7	Compressor Parameters		
	Model	DANFOSS	BD35K
	Refrigerant dosage	g	50

6.2 Product Nameplate

<h1>Haier</h1> <p>Solar driven vaccine refrigerator</p>		<h2>CIRCUIT DIAGRAM</h2>	
Model HTC-60	Temperature class N	<p>SAT1- ELECTRONIC THERMOSTAT SAT2- MECHANICAL THERMOSTAT</p> <p>K - SWITCH</p> <p>M1-COMPRESSOR XP-DC SWITCH POWER</p> <p>M2-FAN 1 M3-FAN 2</p> <p>M4-HEATING WIRE C-CIRCUIT BOARD</p> <p>B-RECHARGEABLE ANCILLARY BATTERY</p> <p>CE</p>	
Effective volume 60 L	Power consumption 0.49 KW·h / 24h		
Vaccine storage Capacity 21L	Power input 90 W		
Rated Voltage 12VDC	Refrigerant R600a 50g		
Maximal Current 5.2A	Net Weight 78kg		
Haier Medical and Laboratory Products Co., Ltd Haier industrial Park Economic Technology Development Zoon Qingdao P.R. China			

7. Product Usage and Daily Maintenance

7.1 General Trouble-shooting Methods

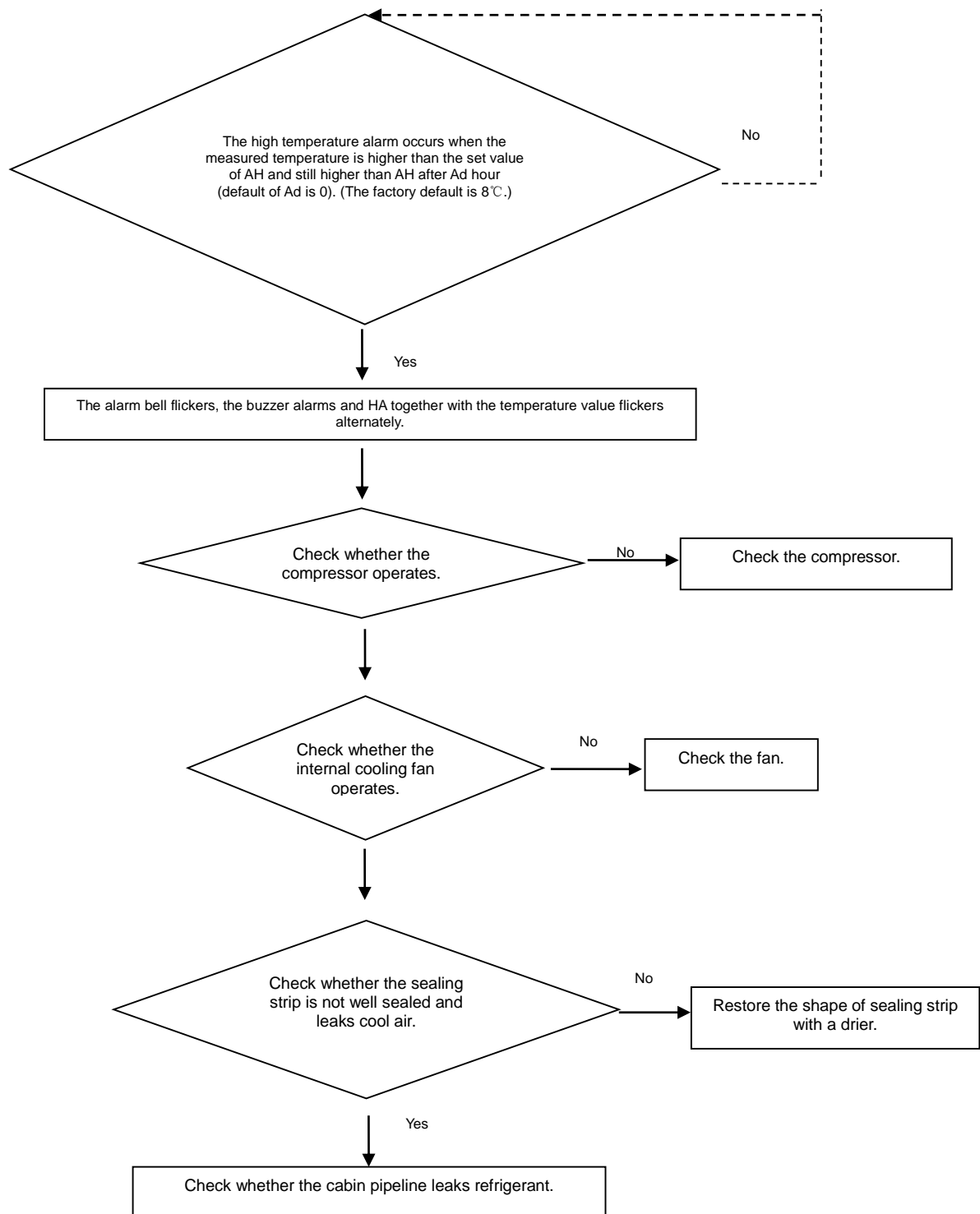
Fault	Possible Causes	Remedial Measures
No operation of compressor	Please wait patiently for the compressor may start in several minutes due to voltage.	Check the following items in case of no operation of compressor: - Check whether the power supply is connected and the cables from solar panel to equipment work normally. - Check whether the "ON" end of main switch is pressed down. - Please contact the after-sales personnel if the above situations are normal.
Over temperature of compressor during operation	Blockage of air grid Blockage or damage of fan of cooling compressor Over ambient temperature for installation equipment	Make sure smooth ventilation. Shield the equipment to prevent it from direct sunshine and ensure good indoor ventilation. Check the operation of the fan and replace it in case of no operation.
Over temperature of solar driven vaccine storage refrigerator	Improper cover closure Blockage or damage of fan in the equipment	Make sure the closure tightness of cover. Check the operation of the fan and replace it in case of no operation.
Too low temperature of solar driven vaccine storage refrigerator	Improper placement of inner cover Abnormal function of partition heating element	Make sure the proper placement of inner cover. Check the operation of heating element. Please contact the after-sales personnel if the above situations are normal.
No temperature display	No installation of 3A fuse or fuse fault Low electric quantity of battery in the cabin Bad function of thermostat	Install or replace 3A fuse. Charge the battery or replace it. Replace the thermostat.

7.2 Trouble-shooting Methods for Electronic Thermostat

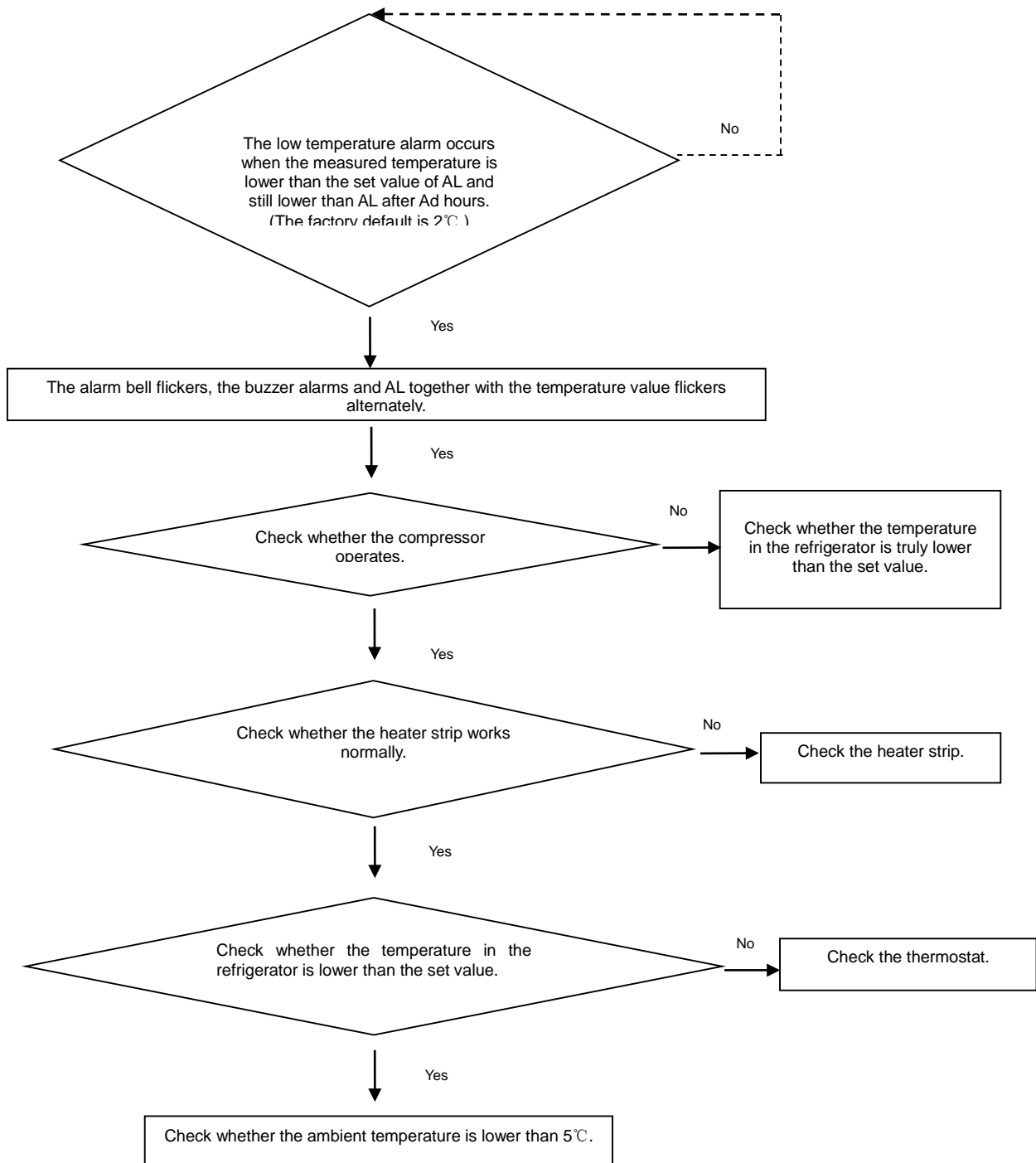
LCD Display of Thermostat	Phenomena	Causes	Solutions
Err	The display screen displays Err, the alarm bell flickers and the buzzer sounds.	Damage of thermostat	Replace the thermostat.
EH	The display screen displays EH.	Perceptive temperature of sensor higher than 85℃	Check where the temperature sensing probe is placed.
EL	The display screen displays EL.	Perceptive temperature of sensor lower than -45℃	Check where the temperature sensing probe is placed.

AH	Alarm bell of display screen flickers and the buzzer sounds.	Temperature in the refrigerator higher than high temperature alarm set value	<ol style="list-style-type: none"> 1. It belongs to normal phenomenon if it happens during the starting-up. 2. Check whether the high temperature alarm parameter is set properly after the internal fan operates for a while. 3. Check the operation of internal fan after the machine operates stably for a while. 4. Find out the causes of high temperature in refrigerator and solve them.
AL	Alarm bell of display screen flickers and the buzzer sounds.	Temperature in the refrigerator lower than low temperature alarm set value	<ol style="list-style-type: none"> 1. Check whether the indoor temperature is lower than 0℃. 2. Check whether the low temperature alarm parameter is set properly. 3. Check the operation of heater strip after the machine operates for a while. 4. Find out the causes of low temperature in refrigerator and solve them.
No operation of display screen	Alarm bell flickers and sounds.	Disconnection of power supply	Re-connect the power supply.

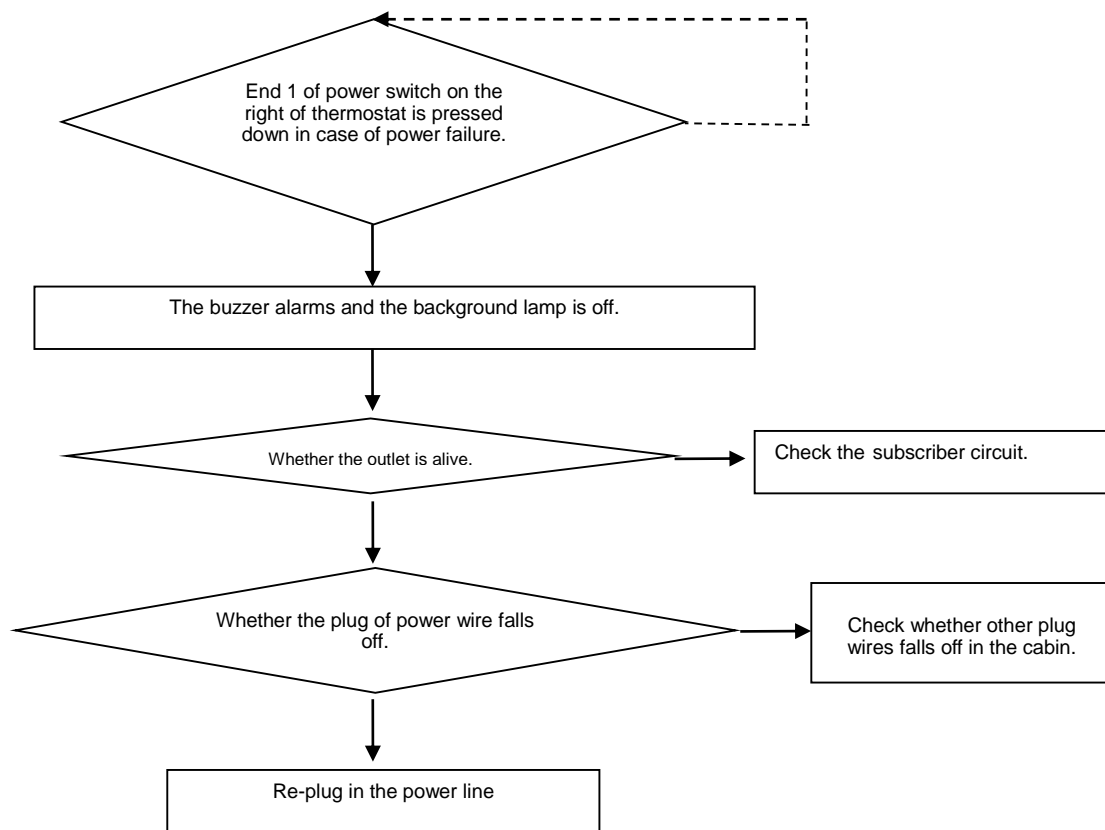
7.2 High Temperature Alarm Processing



7.3 Low Temperature Alarm Processing



7.4 Power Failure Alarm Processing



7.5 Replacement of Fan in Vaccine Refrigerator

A Loosen 4 screws of cover plate to remove the cover plate.

B Loosen 2 fixing screws of the fan and disconnect the fan connection to remove the fan.

C Connect and fix the new fan in the original way.



7.6 Replacement of Auxiliary Rechargeable Battery

Notice: Before replacing the auxiliary rechargeable battery, remove the 3 A fuse firstly to avoid blowout.

The auxiliary rechargeable battery is rated for 9 Ah/12 V.

The terminal specification is 6.3 mm.

Dimensions: L 151 × W 65 × H 100.

A Remove the battery mounting screw firstly.

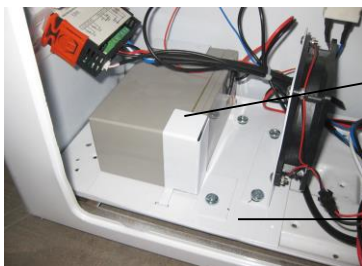
B Remove the battery and disconnect the battery line.

C Connect and fix it in the original way, and note the positive and negative terminals as shown in the figure to avoid reversal.



The red harness shall be connected to the red terminal (+) and black harness shall be connected to the black terminal (-)

Auxiliary rechargeable battery



Remove the screw

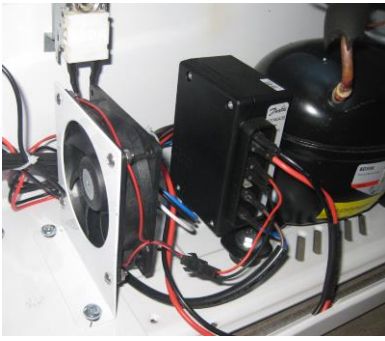
7.7 Replacement of Condensate Fan

It is recommended to remove the auxiliary rechargeable battery firstly to make more space (to be deleted).

A Remove 2 screws of the fan fixing supporter;

B Disconnect the connecting line by loosening 4 fixing screws of the fan to remove the fan.

C Install the new fan as per the steps above.



7.8 Replacement of Compressor Accessories

A Use a screwdriver to loosen the screws of compressor accessories.

B Take out the compressor accessories Ebox to the left and remove the terminal of compressor accessories.

C Connect the terminal to the new accessories in the original way.

D Fit the compressor accessories Ebox to the compressor and tighten the compressor accessories box with a screwdriver.

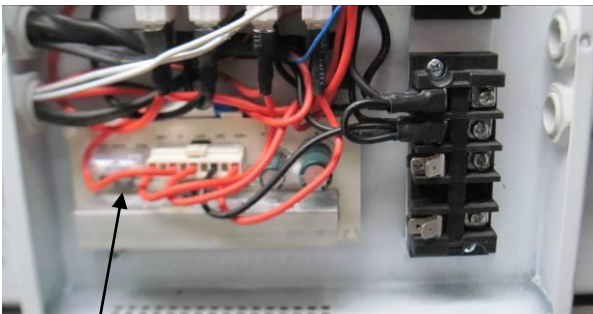


7.9 Replacement of 3 A Fuse

A Remove the fuse cover.

B Remove the fuse from its holder and replace it.

The fuse is in the electric control box behind the refrigerator.

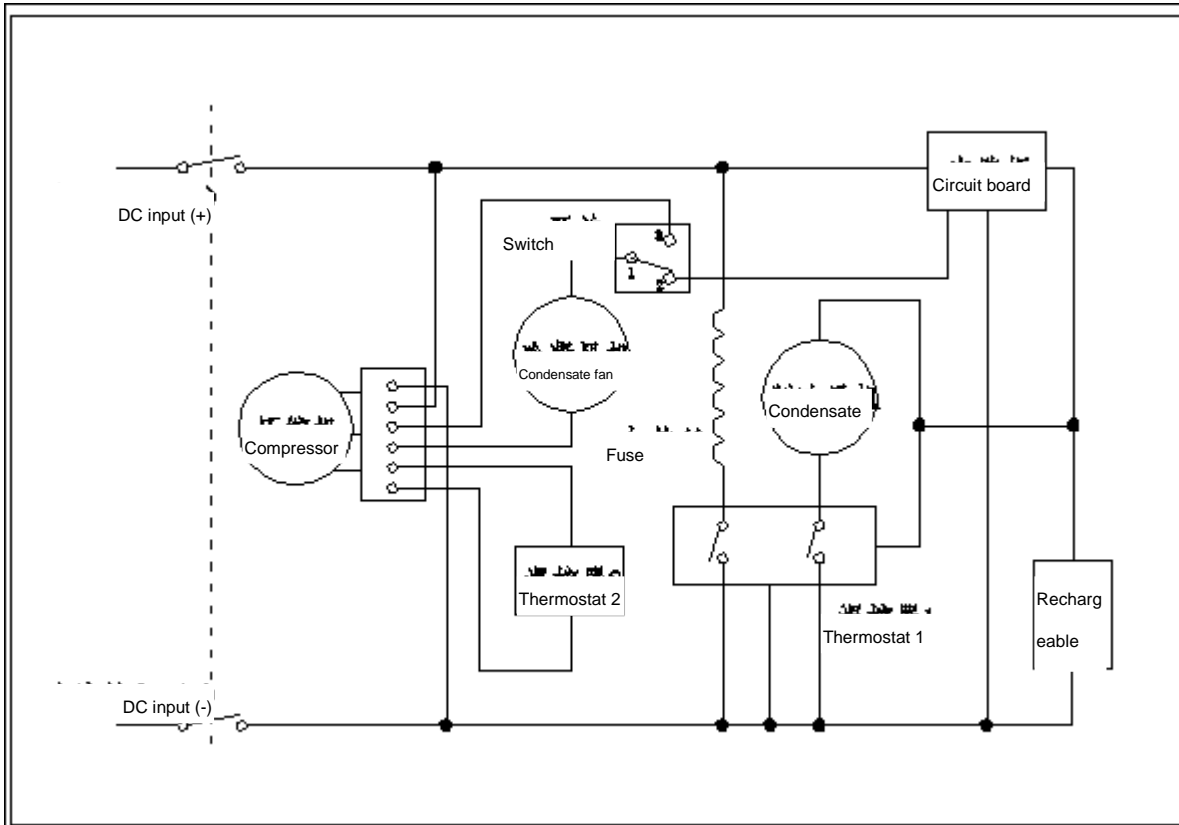


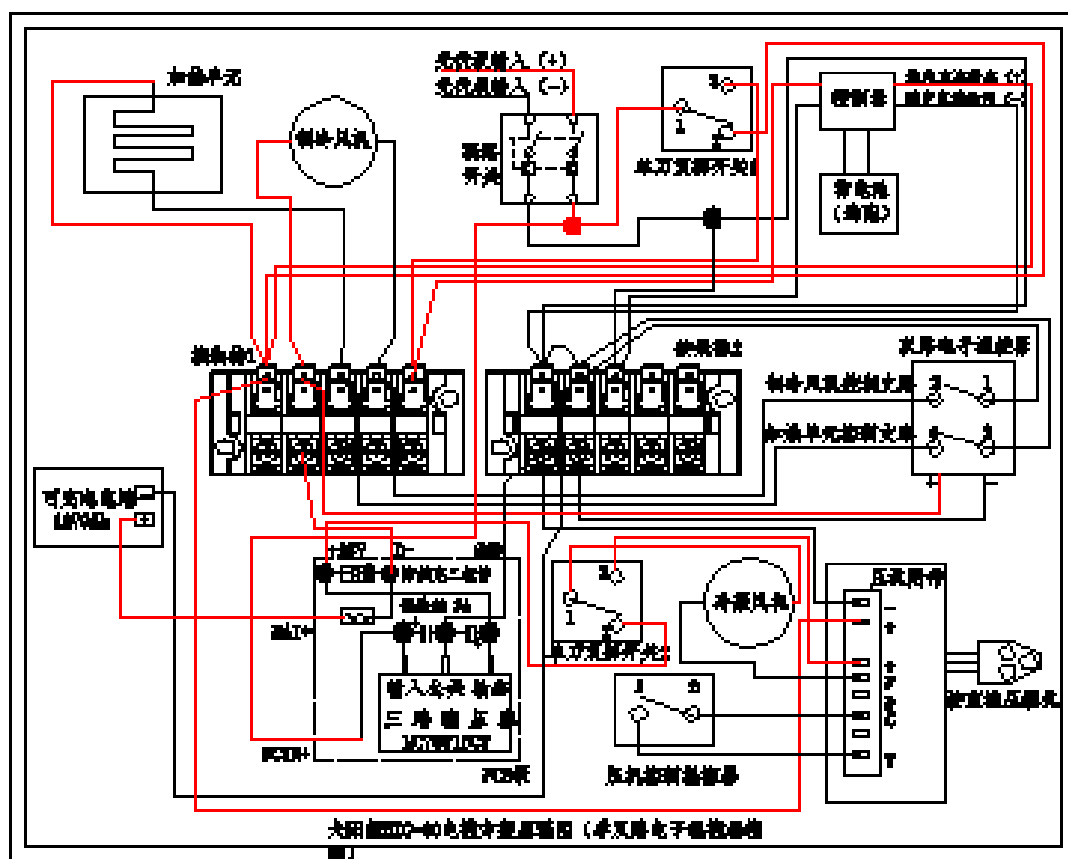
3 A fuse

7.10 Replacement Procedure of Thermostat

- (1) Cut off the power
- (2) Remove the cabin cover.
- (3) Remove the fastening screw.
- (4) Hold the bottom of temperature sensing probe and remove it downwards.
- (5) Install the new thermostat.

8.Circuit Diagram







9. Control and Working Principles and Parameters

9.1. Description of Thermostat Principle

When the internal temperature is higher than the set value, the compressor will automatically run under the thermostat control. The temperature becomes lower and lower as time goes by, and the compressor will stop when the temperature reaches the set value.

The internal temperature can be controlled to the set value through the above working cycle.

Setting Method of Basic Parameters

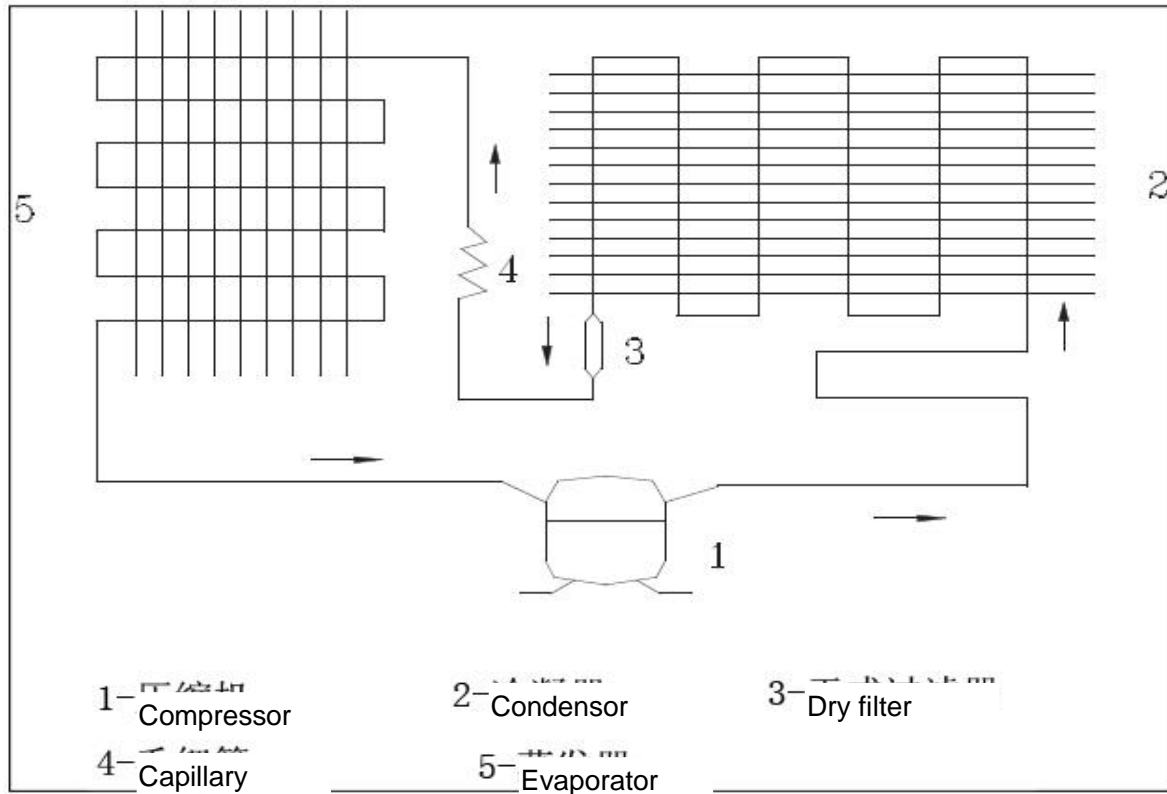
No.	Key Operation	Display
1	Press the SET and  simultaneously for more than 3s for unlocking	 on the display disappears
2	Press the SET and ▲ simultaneously for more than 3s	PS is displayed
3	Press the ▲ or ▼	AH1 is displayed
4	Press the SET and ▲ or ▼	8 is displayed
5	Press the SET and ▲ or ▼	AL1 is displayed
6	Press the SET and ▲ or ▼	2 is displayed
7	Press the SET for more than 3s to save the set value	The temperature inside the refrigerator is displayed
8	Press the SET for about 3s	PS is displayed
9	Press the ▲ or ▼	-15 is displayed
10	Press the SET and ▲ or ▼	SP1 is displayed
11	Press the SET and ▲ or ▼	4.5 is displayed

12	Press the SET and ▲ or ▼	SP2 is displayed
13	Press the SET and ▲ or ▼	3.5 is displayed
14	Press the SET and ▲ or ▼	r0 is displayed
15	Press the SET and ▲ or ▼	1 is displayed
16	Press the SET and ▲ or ▼	r1 is displayed
17	Press the SET and ▲ or ▼	0.5 is displayed
18	Press the SET and ▲ or ▼	r2 is displayed
19	Press the SET and ▲ or ▼	8 is displayed
20	Press the SET and ▲ or ▼	r3 is displayed
21	Press the SET and ▲ or ▼	2 is displayed
22	Press the SET and ▲ or ▼	r4 is displayed
23	Press the SET and ▲ or ▼	0 is displayed
24	Press the SET and ▲ or ▼	CAL is displayed
25	Press the SET and ▲ or ▼	0 is displayed
26	Press the SET and ▲ or ▼	t1 is displayed
27	Press the SET and ▲ or ▼	0 is displayed
28	Press the SET and ▲ or ▼	t2 is displayed
29	Press the SET and ▲ or ▼	0 is displayed
30	Press the SET and ▲ or ▼	Ad is displayed
31	Press the SET and ▲ or ▼	dF0 is displayed
32	Press the SET and ▲ or ▼	0 is displayed
33	Press the SET and ▲ or ▼	dF1 is displayed
34	Press the SET and ▲ or ▼	15 is displayed
35	Press the SET and ▲ or ▼	ct0 is displayed
36	Press the SET and ▲ or ▼	15 is displayed
37	Press the SET and ▲ or ▼	ct1 is displayed
38	Press the SET and ▲ or ▼	8 is displayed
39	Press the SET for more than 3 s to save the parameter	Current temperature

Setting of Internal Parameter

Ambient Tempera ture	Set Tempera ture SP1	Set Tempera ture SP2	r0	r1	r 2	r 3	r 4	CA L	t 1	t 2	A d	dF 0	dF 1	ct 0	ct 1	AH 1	AL 1
25±3	4.5	3.5	1. 0	0. 5	8	2	0	0	0	0	0	0	15	1 5	8	8	2

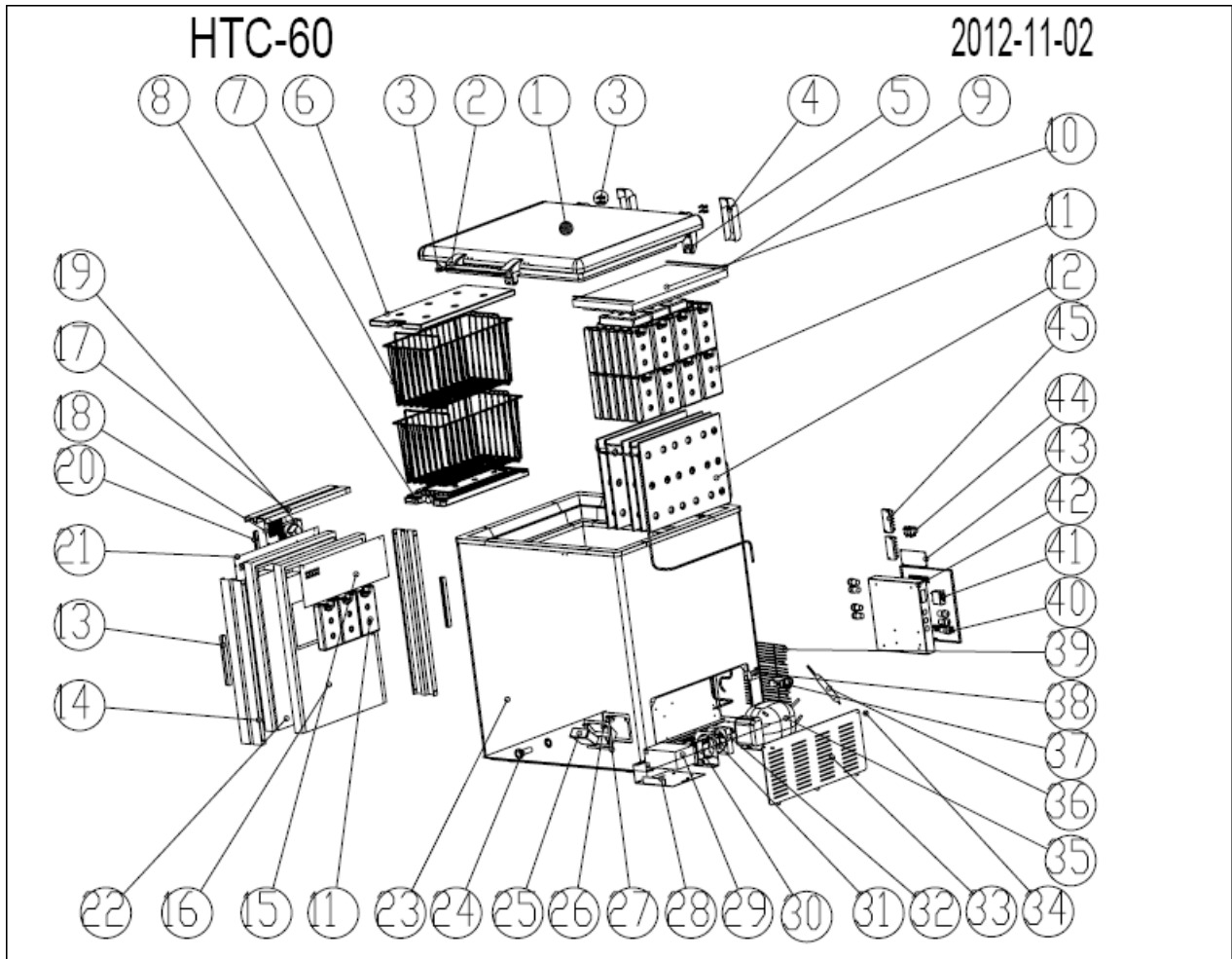
10. Structure Diagram of Cooling System



The cooling system of Haier vaccine refrigerator is of direct cooling type.


The cooling effect is achieved by the compressor working controlled by the thermostat, which is detailed as follows: the compressor working makes the refrigerant flow through the condensor, dry filter, and evaporator and finally back to the compressor, which is a complete cooling cycle.

11. Exploded View



12. Details of Exploded View

12.1 Details of Exploded View

		Vaccine Refrigerator			Model: HTC-60		
Release Date (Y-M-D):		2012/11/2	Product Code:		BE07F4E0N		
No. in exploded view	Spare parts code	Spare parts description in English	Qty.	Price (RMB)	The reference proportion of the spare part stock	Remark	Related technical bulletin ID number
1	0270800427	Door body assembly	1	90		N	
2	0070814623	Handle assembly-N/A	1	8		N	
3	0070601302	Cross recess pan head screw-N/A	12	0.04		N	
4	0070203942	Hinge cover-N/A	2	0.2		N	
	0070204349	Hinge cover-PS	2	0.5		N	
5	0070816334	Assembly of hinge-component	2	5.2		N	
6	0270200225	Water disposal pan - HDPE	1	12		N	
7	0270100797	Food basket-mild carbon steel	2	11		N	
8	0070204757	Cold storage box	1	8		N	
9	0270101066	Ice bank bubble fixing strip	2	5		N	
10	0270200490	HTC-60 inner cover (foamed)	1	75		N	
11	0070203825	Small ice bank	54	2.5		N	
12	0270700084	Evaporator-TP2M	1	280		N	
13	0070204679	Inner liner connecting strip	2	0.2		N	
14	0270200484	Vertical edge of center sill extrusion part	2	8		N	
15	0270101113	Center sill plate of ice bank area - SUS304	1	16		N	
16	0270500358	Foam in the partition-ice bank area	1	6		N	
17	0270200483	Upper and lower edges of center sill extrusion part	1	6		N	
18	0270101114	Fan guard - SUS304	1	5		N	
19	0074000329	Fan -DC 12 V	1	12		Y	

20	0070201891	Wire cover fillet	2	0.6		N	
21	0270101116	Center sill plate of vaccine area - SUS304	1	52		N	
22	0270500357	Foam in the partition – vaccine area	1	7		N	
23	0270800428	Assembly of refrigerator body	1	840		N	
24	0072040060	Drainage casing	1	0.2		N	
25	0274000185	Thermostat –DC 12V	1	90		Y	
26	0072040234	Control panel	1	1.5		N	
27	0077050006	Cross recess head screw -N/A	2	0.03		N	
28	0270101139	Cold roller steel of battery fixed iron plate	1	5		N	
29	0074091430B	Battery - general 12 V 9 Ah	1	400		N	
30	0270101139	Cold roller steel of battery fixed iron plate	1	2		N	
31	0270101140	Fan supporter	1	4		N	
32	0074000329	Fan -DC 12 V	1	12		Y	
33	0070106186	Cabin grid	1	3.6		N	
34	0077010059	Cross recessed big flat head tapping screw	2	0.03		N	
35	0274000118	Danfoss compressor DC 12 V	1	950		Y	
36	0074180006	Dry filter	1	4.5		Y	
37	0074000154	Mechanical thermostat	1	11		Y	
38	0070101676	Thermostat supporter	1	0.5		N	
39	0070103022	Cabin cover	1	2		N	
40	0070201868	Threading casing	7	1.8		N	
41	0274000098	Switch	1	75		Y	
42	0270101115	Electric cabinet cold rolled steel	1	42		N	
43	0271800027	PCB board	1	9		N	
44	0074091465	Single-pole double throw switch	2	2		Y	
45	0274300007	Connector bar	2	6		N	

1. If the color of the spare parts number is red, it means that the number has been changed, please pay attention when you place the Spare Parts order to us.

2, The reference proportion of the spare-part stock is considered as the reference of the stock for spare-parts. The first time should be stocked in proportion of the estimated spare-parts, and it should be adjusted with the actual quantity 3 months later.

3, Marking "***": easy-damaged part; The spare-part which is often damaged and the customer must stock in the spare-parts warehouse.

4, Marking "****": possible damaged part: The spare-part which is not so often damaged like the easy damaged one and the customer may stock in the spare-part warehouse according with the actual needed case.

5, Marking "x": part not need provided: The spare-part which is rarely damaged or need to be repaired rarely. The customer doesn't need to stock the spare-part in the warehouse.

6. Marking "assembly" : only supply assembly :The spare-part which could only be supplied as an assembly part should be marked with "assembly"

7, Above listed rules should be controlled and adapted in accordance with the reply of the market every half year.

8. The spare parts price is net FOB Qingdao term at the time when this list is making, and the current price is subject to spare part manger's final confirmation.

12.2 Detailed List of Easily Damaged Parts

Model	No.	Detailed Information of Parts	Specification or Model	Special No.
HTC-60	1	Compressor	Danfoss BD35K	0274000118
	2	Thermostat	Chunchang electronic thermostat	0274000185
	3	HTC-60 inner cover	PE	0270200490
	4	Fan	DC 12 V	0074000329
	5	Battery	12V9Ah	0074091430B
	6	Mechanical thermostat		0074000154
	7	PCB		0271800027